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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/613,162	07/10/2000	Thomas Carl Mesing	13DV12817	9214
31450	7590	06/16/2004	EXAMINER	
MCNEES WALLACE & NURICK LLC 100 PINE STREET P.O. BOX 1166 HARRISBURG, PA 17108-5300			MUSSER, BARBARA J	
			ART UNIT	PAPER NUMBER
			1733	

DATE MAILED: 06/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/613,162

Applicant(s)

MESING ET AL.

Examiner

Barbara J. Musser

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 and 31-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

1. In view of the appeal brief filed on 3/29/04, PROSECUTION IS HEREBY REOPENED. The rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 11 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. One in the art reading the application would not have understood that applicant intended to use curable resin sheets with embedded fibers in a resin transfer molding process since the specification indicates that pre-

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impregnated fiber plies can be replaced by resin transfer molding(Pg. 10, ll. 6-7) particularly since conventional resin transfer molding uses fiber sheets not containing resin particularly since the second paragraph of claim 11 indicates sheets of fiber are used.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 11 recites the limitation "the plurality of sheets of fiber" in line 6. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-12 and 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wiley in view of Doyle(U.S. Patent 5,271,588), Livesay et al., and the admitted prior art.

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Wiley discloses forming tube clamps by compression molding fiber-reinforced polymer in the shape of a tube clamp and then removing the shaped material from the mold.(Col. 3, ll. 44-57) While the reference discloses polyamide, a thermoplastic, the material listed, PMR-15, is a mixture of polyimide and carbon fibers as shown by Doyle(Col. 6, ll. 40-41) Clearly the use of polyamide rather than polyimide is a spelling mistake in Wiley. Thus the material used, PMR-15, is a thermosetting material, i.e. is capable of curing. One in the art would appreciate that the material was cured as that is how thermosetting materials are intended to be used. While the reference does not specifically disclose using preforms in the compression molding operation, the reference does call the material a composite prior to compression molding(Col. 3, ll. 44-45) and the dictionary defines a composite as a solid material comprised of two or more substances having different physical properties. Therefore, Wiley et al. discloses compression molding a solid preform. In a prepreg, the fibers lie within the sheet. Therefore after compression molding, the fibers would still lie within the sheet and would not be exposed.

Wiley is silent as to whether one or more layers of material are used to form the tube clamp. However, using one or more sheets of fibers to form a composite is well-known per se in the composite molding arts as shown for example by Livesay et al. which discloses one or more fiber sheets can be laid-up in a mold to form a structure(Col. 4, ll. 12-17) and by the admitted prior art which discloses forming a tube clamp from multiple layers of material.(Pg. 2-3) It would have been obvious to one of ordinary skill in the art at the time the invention was made to use multiple fiber layers as

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it is known in general in the molding arts to use one or more layers of fibers to form a product as shown for example by Livesay(Col. 4, ll. 12-17) particularly in view of the admitted prior art which discloses it is known to make tube clamps from multiple layers of material(Pg. 2-3) and since the thinness of prepregs is well-known in the molding arts. Since the prepregs do not have any exposed fibers, the molded prepregs would not have any exposed fibers since no process was performed on them that would expose fibers. It is noted that the fibers are within the plane of the sheet, i.e. they do not extend beyond the surface of the sheet of curable material since that is the structure of prepregs.

Regarding claims 2-4, Wiley et al. does not disclose pre-pregs where the fibers are all substantially parallel to the plane of the sheet. Doyle discloses a composite tube clamp made from random or aligned, i.e. oriented, fibers impregnated in a thermosetting resin(Col. 6, ll. 35-50) but does not disclose the aligned fibers being unidirectional, bi-directional, or forming a woven fabric. Livesay et al. discloses that aligned fibers can be unidirectional or form woven fabric.(Col. 4, ll. 12-17) It would have been obvious to one of ordinary skill in the art at the time the invention was made to use unidirectional fibers in the tube clamp of Wiley since Doyle discloses random and aligned fibers are well-known alternatives when forming a tube clamp and that aligned fibers provide suitable strength to the clamp.(Col. 6, ll. 47-50)

Regarding claim 3, one in the art would appreciate that the aligned fibers of Doyle in the clamp of Wiley could be either unidirectional fibers or woven fabric since Livesay et al. discloses these types of aligned fibers can be used in molding, and since

one in the art would use the generally available types of aligned fiber pre-pregs as shown for example by Livesay.(Col. 4, ll. 12-17)

Regarding claim 4, woven fabrics are considered bi-directional since the warp and weft are oriented in different directions.

Regarding claim 5, the sheet is formed from graphite fiber with polyimide resin.(Wiley, Col. 3, ll. 49; Doyle, Col. 6, ll. 40-41)

Regarding claim 6-8, Wiley discloses a clamp with the same thickness throughout. The admitted prior art discloses a clamp with a different thickness in different locations.(Figure 1) One in the art would appreciate the method of Wiley, Doyle, and the admitted prior art could be used to form other types of clamps such as that of the admitted prior art since they are both clamps used in the airline industry and therefore have the same type of requirements. When forming clamps such as that of the admitted prior art, one in the art would appreciate that a filler would be needed between the top and bottom of the clamp as the clamp is not the same thickness throughout and fiber plies are. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use some type of filler such as fiber plies cut to shape since this would fill in the space between the top and bottom of the clamp known in the admitted prior art while using the same types of materials with the same strengths.

Regarding claims 10 and 11, Wiley discloses the clamp is compression molded.(Col. 3, ll. 50-51) but does not disclose the exact type of apparatus used. Livesay et al. discloses products can be formed by laying up dry fiber mats,

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impregnating them with resin, and autoclaving them.(Col. 1, ll. 29-39) It would have been obvious to one of ordinary skill in the art at the time the invention was made to lay-up dry fiber layers, impregnate them with resin, and autoclave them, since Livesay et al. discloses this method forms structures with high strength-to-weight ratios(Col. 1, ll. 16-20) as would be required for a clamp.

Regarding claim 12, Wiley discloses the process to make a clamp. One in the art would understand that a clamp would have two halves, both made via the same molding technique.

9. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wiley, Doyle, Livesay et al, and the admitted prior art as applied to claim 2 above, and further in view of Yamamoto et al.(SIR H1162).

The references cited do not disclose different plies of unidirectionally oriented fibers arranged in different directions so the fibers are at an angle to each other. It is well known in general in the fiber prepreg arts to orient different layers of unidirectional fibers in different directions so that the web is not weak in any one direction in particular as shown for example by Yamamoto et al. which discloses layering multiple layers of unidirectional plies so that the fibers are oriented in different directions.(Figure 6) It would have been obvious to one of ordinary skill in the art at the time the invention was made to orient different plies of unidirectional fibers in different directions since it is well-known in the general in the fiber prepreg arts to do so as shown for example by Yamamoto et al.(Figure 6)



***Claim Objections***

10. Claim 11 is objected to because of the following informalities: in line 1, the word "claim" appears. This appears to be a misspelling of --clamp--. Appropriate correction is required.

***Response to Arguments***

11. Applicant's arguments filed 3/5/04 have been fully considered but they are not persuasive.

Regarding applicant's argument that Wiley et al. only discloses a single ply of prepreg, such is clearly exemplary particularly considering that such prepreps are conventionally extremely thin.

Regarding applicant's argument that the exposed fibers in Wiley et al. formed by slicing the cured composite into clamps are the source of the problem applicant solves, the reference is doing the same thing applicant is, namely forming the clamps on a shaped surface, and then cutting them to make multiple clamps as on page 5, lines 3-6 of applicant's description of the invention. The exposed fibers of Wiley et al. are formed after removal from the mold and are on a surface perpendicular to the surface of the clamp which contacts the pipe. It is particularly noted that applicant also slices the molded composite to form multiple clamps, thus exposing fibers. Applicant has not indicated that the clamps are sliced parallel to the fibers, and when woven sheets are used, fibers would be cut no matter which direction cutting occurred in. Therefore,

applicant's invention also includes exposing fibers. Wiley et al. does not mention the problem solved by applicant since the problem does not exist in the reference since the surface contacting the clamp does not have exposed fibers.

Regarding applicant's argument that the grommet of Wiley et al. suggests the need to isolate the tube from the clamp, Wiley et al. discloses the grommet is to hold the tube snugly in place in the clamp.(Col. 4, ll. 18-20) It is noted that applicant does not require the absence of a wear sleeve.

Regarding applicant's argument that Doyle does not disclose a direction to the aligned fiber, Doyle discloses that the aligned fiber plies are used to provide suitable strength to the clamps and it is well-known that the strength of a ply is in the fiber direction and that aligned fiber plies have the fibers aligned in the length direction of the ply. Since Wiley et al. discloses the composite is placed on the contoured mold, one in the art would appreciate that the plies having aligned fibers would also be placed on the contoured mold in the same manner since cutting them would reduce the strength of the plies and their strength is the reason plies with aligned fibers are used.

In response to applicant's argument that Doyle discloses the fibers will abrade and this is beneficial, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Regarding applicant's argument that Wiley et al. teaches away from sheet plies, the reference discloses a composite is used in compression molding. Composites are

defined as solid materials composed of two or more substances with different physical properties. Therefore, one in the art would understand that the reference teaches the use of preforms.

Regarding applicant's argument that Doyle does not disclose the plies are layered along a contour, cured and removed from the tooling without exposing fibers, Wiley et al. teaches a composite, e.g. a solid, is compression molded into a final configuration. Therefore, one in the art would appreciate that it was laid on a mold having the final configuration, e.g. a contoured mold, since the molded shape is intended to be the final configuration. Since composites made with the aligned fibers of Doyle would not have exposed fibers, the clamp when removed from the mold would not have exposed fibers.

Regarding applicant's argument that the teaching of Doyle is contrary to the teachings of Wiley et al., Wiley et al. teaches using a preformed solid layer to mold and Doyle teaches the use of preformed solid layers.(Col. 6, ll. 40-41) Doyle discloses the use of either composites with random fibers, as in Wiley et al., or composites with aligned fibers can be used to make a clamp indicating they are well-known alternatives in the art. Wiley et al.'s use of randomly oriented fibers is clearly only exemplary as it is not the focus of the invention. Doyle does not teach away from Wiley et al., but rather is silent as to the fabrication method of the clamp. It is noted that Wiley et al. does not teach continuous compression molding.

Regarding applicant's argument that claim 11 does not disclose laying up dry fiber mat, the claim is based on the concept of resin transfer molding which uses dry

fiber mats. The inclusion in the claim of the mats being impregnated with resin before injection of the resin is clearly and accidental error created when the claims were last amended. See the rejection under 112, 1<sup>st</sup> for a more detailed explanation.

Regarding applicant's argument that the references do not teach curing to at least near net shape, Wiley et al. discloses the composite is compression molded into the final configuration. The final configuration is clearly the final net shape so Wiley et al. discloses curing to at least near net shape.

Regarding applicant's argument that random fiber composites would expose fibers, applicant's own specification lays up random fiber composites on a mold and since the purpose of the invention is to prevent exposed fibers from wearing on the tube, it indicates that the fibers are not exposed after it is removed from the mold.

Regarding applicant's argument that Doyle discloses machining the clamp, the reference appears to be silent as to how the clamp is formed. Additionally, Wiley et al. discloses forming the clamp using a composite sheet on a mold shaped to the final desired configuration.

Regarding applicant's argument that the grommets of Wiley teach away from the invention as they shield the tube from the clamp shell, applicant does not require that the interior surface of the clamp directly contact the tube being clamped. The claims do not exclude a grommet.

Regarding applicant's argument that there is no teaching or suggestion in Wiley to use multiple layers, a variation in a process that is well-known in the art such as using multiple layers rather than a single layer would have been obvious to one of ordinary

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skill since the use of multiple layers in molding is extremely well known. The teaching or suggestion can be found in the knowledge of one in the art. Although the references do not state it is known in the clamp making art to use multiple layers, it is known in general in the molding arts, which are used to make the clamp.

Regarding applicant's argument as to exposing the fibers, since the combination of references uses aligned fibers molded to the final shape in the same method with the same materials as applicant, the same result would occur, namely that the fibers would not be exposed.

The changes to Wiley would not be contrary to the teaching of the art as a whole since they are simply the replacement of a single layer with multiple layers as is well-known in general in the molding arts, and the replacement of the random fiber mat of Wiley with an aligned fiber mat as in Doyle, and Doyle is directed to clamps as is applicant.

Regarding the problem solved by applicant being abrasion of the tube, applicant has not amended the claims such that the limitation of the clamp directly contacting the tube is present.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Barbara J. Musser** whose telephone number is **(571) 272-1222**. The examiner can normally be reached on Monday-Thursday; alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571)-272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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